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ABSTRACT

An investigation of response associations to 100 structural and lexical words was conducted in such a way as to observe commonalities of responses to the words, effects of sex differences on the commonalities, and effects of word learnability on the commonalities. Subjects were 80 white urban disadvantaged children, all 5 years old, divided into four random groups. Each subject was required to respond to 25 words and responses were recorded on cards. Commonalities, representing about 25 percent of the responses, were classified as syntactic, paradigmatic, phonological, and indeterminate and were analyzed descriptively. Phonological commonalities were most common, monosyllables produced more common responses than did polysyllables, and syntactical commonalities seemed more common than did paradigmatic. It was suggested that greater attention be paid to syntactical development in children and to the inverse relationship between syntax and syllable length. The essentially idiosyncratic nature of the responses given (75 percent) implies that these children may have been making immature associations which could later produce reading difficulties. References are included. (MS)

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"System-Word Associations of Deprived Children"

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The study was concerned with the response associations to one hundred structural and lexical words selected from Coleman's (1968) learnability list. The purpose of the study was to extend to a different cultural population an investigation previously done by Doak (1969). The population chosen by Doak for investigation of the responses to this list of words represented five-and six-year-old kindergarten children who were defined indirectly as average, middle-class and achievement-oriented. To supplement Doak's data, the present study extended this population to include the range of students who could be defined as economically poor, culturally disadvantaged, and academically deprived.

An encompassing question posed by the present investigation centered around whether responses elicited from the Doak population were quantitatively and qualitatively generalizable to a population which was quite dissimilar; that is, would responses to a list of stimulus words be as much a function of the words as of the population providing the responses.

It would be expected that subjects with similar backgrounds environmentally, educationally, and culturally would give similar responses to the various stimulus words. It would be further expected that the amount of information transmitted as well as the quality of information transmitted would be more likely homogeneous within a subset of a culture than across subsets of the same culture. The degree to which this similarity occurs within a specified population of people and responses has been labeled commonality. Complete commonality would imply that all subjects would produce the same responses to the same set of stimulus words. Since the informational quality of words varies, and since people themselves tend to be heterogeneous, the degree of commonality expected from a stimulus word would be licitly expected to vary from time to time and sample to sample.

For purposes of this study, lexical words were defined as nouns, main verbs as opposed to auxiliary verbs, and adjectives. These words are concrete representations or abstractions which can be categorized into lexical form classes. Structural words were defined as all words other than lexical words which form a union with the lexical thus giving meaningful interpretation to the lexical words and which when used in conjunction with lexical words provide meaning to the language. Further, the word deprived as used in this study was defined in an ad hoc fashion. For this study all subjects selected were children whose families were categorized by local social agencies as living at a poverty level

economically. Many were in poor health, their parents were often on welfare, the provision of financial and parental support was unstable at best.

Focus of Investigation

The foci of the investigation were directed in three channels: (1) commonalities of responses to structural and lexical words; (2) sex differences and the commonality of associations to structural and lexical words; and (3) the commonality of the associations relative to the learnability of words.

The set of common responses have been classified into four categories: syntactical, paradigmatic, phonological, and indeterminate. Some explanation of these terms is in order since they have a specific meaning to this study. Traditionally, syntactical responses have been linguistic conventions with particular examples being specific to a language or to a subset of a language. As used in this investigation, a syntactic response was considered as any response which logically followed from the syntactic structure of the language and which provided a complete thought or provided closure for a stimulus word. Although the subjects involved in this study were five years of age, the responses which were given were subject to categorization consistent with adult logic. Thus, any common response would seem linguistically and syntactically sequential was classified as a syntactic response.

Those common responses which were of the same form class, as a stimulus word which could be meaningfully or logically substituted for the stimulus word were classified as paradigmatic. Synonyms, antonyms, and words of the same grammatical class fell in this category. All responses that were classified as paradigmatic also exhibited one of the following relationships: superordinate, co-ordinate, part-whole, or contrast. Examples of paradigmatic responses would

be: Response word brother to stimulus word sister, lady for girl, or what for when.

A phonological response was one which was primarily homonymic or phonically related to the stimulus word. Generally, these are words which could not be legitimately classified as paradigmatic or syntactic. Examples of phonological responses would be bemember for the stimulus word remember, and mouse for house.

The last category labeled indeterminate included all common responses not readily or meaningfully classifiable as syntactical, paradigmatic or phonological. Perceptual cues presumably stimulated by a lack of ready response to the stimulus words were relegated to this category. The inclusion of a category of this nature was deemed necessary because of the general reduction in verbal facility which seemed an apparent concomitant of cultural deprivation. Examples of indeterminate responses would be such responses as bookcase, or chair to stimulus words which have no apparent logical, syntactical, or phonological relationship to the stimulus words.

Since the commonality of response could have been a function of the structure of the stimulus word as much as the qualitative organization of the word, a further focus of the study was to investigate the commonalities of both the structural and lexical words relative to the number of letters in the stimulus word, the number of phonemes and the number of syllables.

Procedures

All subjects were five years of age and were labeled deprived according to the definition given earlier. The social economic level could be considered among the lower third in the United States. Forty boys and forty girls were randomly chosen from the students at the Chenango Forks (New York) School System

who met the criteria for deprivation. All subjects were white, native-speaking American.

Stimulus Words

Fifty lexical and fifty structural words were chosen from the list of words developed by Coleman. For this study the words were not randomly selected but were rather a replication of the selection of words utilized by Doak (1969). Doak chose three words from each level except for the two levels which contained less than three words. The fifty lexical and fifty structural words were originally chosen so as to most nearly correspond to the error level suggested by Coleman.

Method

The one hundred stimulus words were divided into four presentation groups. The method of selection of each word and its appropriate group is described by Doak (1969). Twenty-five words, both lexical and structural, appeared in each group. Four groups of subjects were defined with ten boys and ten girls randomly assigned from the population described. A division of the stimulus words into four groups and the restriction of words presented to twenty-five words per subject was done for purposes of facilitation of administration. With each subject assigned to one group and each group limited to twenty-five words, no subject was required to respond to more than those twenty-five words to which he was assigned. Since all the subjects were beginning kindergarten children, none could read or write. Thus, all words were presented orally and individually. The purpose of this inquiry was to replicate a previous study on a different population, and so the problem presented by the homonymic words was not controlled, nor were the problems presented by pseudo-homonyms. The impact of heterogeneous

noncontrollable factors such as environmental cues, differing classrooms, and other sources of internal invalidity were minimized as much as possible by administering all tasks in the same relatively empty conference room provided for this purpose. The same examiner was used in all cases, this examiner was previously unknown to the subjects.

All responses given were recorded on a 3x5 index card with one stimulus word and the twenty responses recorded on the card. For bookkeeping purposes the informational statistic obtained by Doak and the informational statistic obtained in the present study were recorded on this card.

Analysis of Data

In the main, the data obtained in this study were presented descriptively. When analyses were performed, the informational theory logarithmic transformational statistics were employed. The informational content of each stimulus word was obtained by using the transformation suggested by Attneave (1959). The basic statistic is labeled Hx and is nothing more than a measure of the variability of information in bits. Hx is maximal when there is no commonality in the response, that is, all responses are unique responses. Hx is minimal when all subjects make the same response to a stimulus word. The greater the number of bits produced by the stimulus word the more information the word conveys.

Results and Conclusions

Informational variability for stimulus words was found to be very high for this group of subjects indicating a low redundancy factor in the associations. This is reflected in the paucity of commonalities in responses and the subsequent number of unique responses offered. Commonalities of magnitude two accounted for nearly half of all common responses, and only about ¼ of all the responses

given were common; 3/4 were unique. This result is directly the reverse of what Doak found. Doak's subjects, a more achievement-oriented group, produced about 3/4 common responses and 1/4 unique. This reversal is too dramatic to be ascribed to sample size or item selection. The more poignant argument suggests population differences of the nature which generated the study.

The investigation bore out the conclusion by Doak relative to sex differences in responses. Doak maintained that at the five-year-old level no meaningful differences in commonality responses could be attributed to sex. This was also the finding of this study. Bickley (1969) in a study of learnability also concluded that no sex differences of any interpretable nature were manifest in small children. These conclusions, while congruent, appear to represent an unpopular minority in the literature of studies of young children.

A qualitative examination of responses produced some evidence that these subjects may be operating on an entirely different plane than more advantaged children. Clinical observation of the children in the act of responding produced some verification of the suggestion of Brown and Berko (1960). Brown and Berko speculated that word associations of young children would often appear illogical or irrelevant when the child does not have an association for the stimulus word. Clearly, one of the concomitants of deprivation is a reduced verbal facility. The expectation of a meaningful response from a subject whose language command is at best mediocre is in most euphemistic terms, optimistic. Faced with a stimulus word for which the language experience had provided no ready associate, the subject would seek out a perceptual cue, some object in a testing room, as his response rather than disappoint the experimenter by offering no response. The effect of this environmental or perceptual cueing

was to reduce potentiality for commonality, to increase the informational value of the stimulus word and to render the association less redundant, therefore, less learnable. While perceptual cueing is not to be deprecated, it may camouflage for the less perspicacious investigator the validity of the responses, in that the response is less to the stimulus word than to the anxiety generated by no response. To treat responses of this nature in the same manner as other responses may obfuscate rather than clarify their meaning.

Not surprisingly, the finding that the most prevalent common response was syntactical concurred with a similar finding in the Doak study. Apparently, degree of advantageness is irrelevant in this respect, making more generalizable the contentions of Ervin (1961) and Entwisle (1966). Phonological commonalities, however, appeared more often with the deprived group than with the advantaged. These responses indicate a potential lack of response or an attending to sound rather than meaning. Often the response was completely meaningless both in relation to the stimulus and relative to the language. The abundance of these responses was attributed to poor language facility and further bears out Brown and Berko's assertions that responses may be bizarre if associations have not been previously made.

Examination of the data also suggested the possible operation of an idiodynamic set. Often responses by subjects followed a discernible pattern independent of the stimulus word. For example, one subject responded with war material to many of the items: truck, jeep, tank, etc. Another responded with emotionally laden associations: hate, Mr. X. Clearly the latter subject was responding to a current problem rather than to the stimuli, the former catalogued his responses. This type of response did not seem to appear in Doak's study

and is not reported there. The assumption is that the responses are idiosyncratic; the induction is that the idiosyncratic responses are concomitants of linguistic associational deprivation and may be more a function of the deprived population than of the advantaged.

A real weakness of the study was exposed by responses of the deprived child. Since none could read, all were presented the stimuli orally. Because of their lack of verbal discrimination, phonology became a factor. Subjects on occasion seemed to mistake words like which for witch, president for present. Remediation of this problem required both a different mode of presentation and the ability of these subjects to respond validly to the altered mode. Perhaps this problem could be handled by using only concrete lexical words or by utilizing two sensory modes within one. In any case, the responses would be altered interpretively, and then they may lose their linguistic relevance to some psychological relevance.

The finding that monosyllables produced more common responses than polysyllables is congruent with what Doak found. Apparently, young respondents are less keyed to the length of the stimulus than to the number of syllables. Considering the building block process of language, this shouldn't come as a great shock.

Implications for Education

One task of the educator of young children is to build vocabulary in such a way as to make that vocabulary meaningful for communication. Evidence is given in this study which suggests that syntactical commonalities are more common than paradigmatic. We may be more successful in useful verbifacture if we concentrate on syntactical approaches rather than on language model associations. Piaget (1926) gave us the clue for this when he discussed the retention of mental images.

He maintained that associations that are most proximal to the stimulus are those that are retained. In language, at least as it is spoken, experiences with words puts association in a syntax structure. Children learn from experience; language experience is greatly reliant on syntax; syntax then provides the association. This obviously changes with increased experience, but at least in the early stages, syntactical associations render the language redundant, therefore usable.

There seems to be an inverse relationship between the number of syllables in a word and its redundancy. The longer the word in syllables, the more information the word carries, the harder it is to master. Perhaps some tie could be made between syntax and syllable length in the quest to make language meaningful.

An unfortunate reminder of the human condition and a weakness of purely quantitative analysis of this condition comes from the responses given by the deprived subjects when compared to advantaged same-aged subjects. While each group found the words to be essentially the same with regard to informational value, the actual responses were far different indicating that the words may mean entirely different things for different social levels. If so, the different levels are learning different things from the same words. Implications for concept building are frightening, but more ominous are the potential schisms that such variations can cause to a populace already sickly divided. An especial caution to the educator concerned the misreading of responses or associations of children. These deprived boys and girls go through the motions of learning, they feign meaningfulness long before meaningful associations appear. One is easily fooled by the visage of comprehension which masks an associational void.

One useful clue to teaching deprived children was given by their reliance on perceptual cues when associations were not available. With highly experienced

children mental images can generate verbal associations. With deprived children whose experience with language in the environment is limited the need for consensual validation in association formation is underscored. These people do not have the cognitive storehouse to generate a multitude of mental images. They must be given the perception to make the tie.

A final observation which may have use for the educator hinges on the prevalence of the idiodynamic set in deprived children associations. The existence of this set should operate as a bellweather to cue the teacher that the child is making immature associations and probably does not have a meaningful concept to associate with the stimulus. In Doak's study the set was not mentioned. The assumption is that either it did not appear or it was not immediately obvious. Whether this is a function of class differences is debatable. In any case the presence of this type of response should be a cue to linguistic poverty which may eventually show up as a reading handicap.

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